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REPORT DATE

3. REPORT TYPE AND DATES COVERED

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4. TITLE AND SUBTITLE

(FY91 AASERT), RESEARCH TRAINING OF THE EFFECTS OF TOXIC SUBSTANCES ON THE LUNGS

5. FUNDING NUMBERS

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6. AUTHOR(S)

Dr Mark L. Witten

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

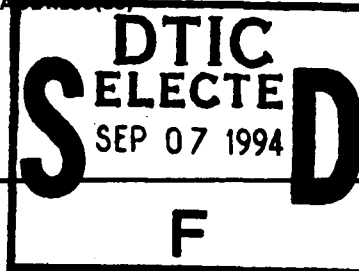
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Dr Kozumbo

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11. SUPPLEMENTARY NOTES



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A

12b. DISTRIBUTION CODE

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Allison and Brian will continue to work on the chronic jet fuel exposure research project. However, Allison will also participate in our magnetic resonance imaging (MRI) project. We are attempting to develop a portable MRI system for deployment on either the Space Shuttle or Space Station. In addition, we are studying the possibility of using MRI in our toxicology experiments to determine changes in blood flow and organ perfusion after exposure to environmental toxins. Both Allison and Brian are intelligent students and I expect them to maintain their high level of performance in their coursework.

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15. NUMBER OF PAGES

16. PRICE CODE

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18. SECURITY CLASSIFICATION OF THIS PAGE

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19. SECURITY CLASSIFICATION OF ABSTRACT

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20. LIMITATION OF ABSTRACT

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SECOND YEAR SUMMARY FOR AASERT GRANT
ENTITLED
RESEARCH TRAINING OF THE EFFECTS OF TOXIC SUBSTANCES
ON THE LUNGS

Mark L. Witten, Ph.D. Principal Investigator

Department of Pediatrics
Arizona Health Sciences Center
Tucson, Arizona

94-28979



68

Submitted to-
Life and Environmental Sciences Directorate
U.S. Air Force Office of Scientific Research
Bolling Air Force Base, DC 20332-6448

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18 JUL 1994

Overall Progress of the Grant

Allison M. Hays and Brian Tollinger are the students supported by the AASERT Training grant. Allison has been accepted into the graduate program in the Department of Exercise and Sports Sciences at the University of Arizona. Brian has worked in my laboratory for the past two years. Brian is a graduate student in the College of Pharmacy at the University of Arizona. Both Brian and Allison are doing well in their graduate programs. In addition, both students presented abstracts concerning the effects of chronic jet fuel exposure on lung function at the Experimental Biology '94 meeting in Anaheim, California (please see enclosed abstracts). Both Allison and Brian are spending the summer months converting their abstracts into manuscripts that will be submitted for publication.

Plans for Year 3 of the Grant

Allison and Brian will continue to work on the chronic jet fuel exposure research project. However, Allison will also participate in our magnetic resonance imaging (MRI) project. We are attempting to develop a portable MRI system for deployment on either the Space Shuttle or Space Station. In addition, we are studying the possibility of using MRI in our toxicology experiments to determine changes in blood flow and organ perfusion after exposure to environmental toxins. Both Allison and Brian are intelligent students and I expect them to maintain their high level of performance in their coursework.

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EXPERIMENTAL BIOLOGY 94

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ALA-P-NITROANILIDE, A SUBSTRATE CLEAVAGE PRODUCT OF NEUTRAL ENDOPEPTIDASE, LEVELS ARE INCREASED AFTER JET FUEL EXPOSURE IN RATS. B.J. Tollinger, A.M. Hays, R.C. Lantz, P.A. Rittenhouse, and M.L. Witten. Steele Memorial Children's Research Center and Center for Toxicology, Arizona College of Medicine, Tucson, AZ and Boston University School of Medicine, Boston, MA.

Neutral endopeptidase, found in lung epithelial cells, has many roles such as modulation of smooth muscle contraction, mucus secretion, and cell growth. Our previous research has demonstrated that increasing jet fuel (JP-8) exposure concentrations causes a proportional decrease in broncho-alveolar lavage concentrations (BAL) of substance P after a 28 day exposure period with the following groups: control (C), low dose JP-8 (LDJ), and high dose (HDJ). We determined whether increasing jet fuel exposures caused a progressive increase in BAL ala-p-Nitro-anilide levels as determined by high pressure liquid chromatography. The ala-p-Nitro-anilide levels (millimoles/ml BAL) were the following: C (N=7) 0.85 (0.15), LDJ (N=6) 1.33 (0.58), and HDJ (N=7) 3.22 (0.73). We conclude that chronic inhalation exposure to jet fuel causes progressive increases in lung neutral endopeptidase which in turn may be responsible for the decrease in lung substance P levels. Supported by AASERT/AFOSR 91-0199.

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APS ASPET ASIP AIN/ASCN AAA

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SELECT CATEGORY NUMBERS & TITLES
(See Topic Category Lists)

1. 936-RB Air Pollutants
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Member's Name (Print or Type) Mark L. Witten, Ph.D.

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